

the student of plant morphology, and from the manner in which they have been compiled they should admirably serve the purpose. The first key, to the phyla of organisms, orients the student as to the organization of the living world, with its four kingdoms (following recent proposals of Dr. Herbert Copeland), eleven divisions, and forty-six phyla. There follow twenty pages of keys to the orders of the various plant phyla. The author states that these keys were assembled especially from the writings of C. E. Bessey and J. H. Schaffner, but the attempt was made to reflect the views of other authorities. The appended glossary and selected bibliography add much to the utility of the work, which has been attractively printed on rag paper with the pages broader than high to facilitate the presentation of the dichotomous keys. This utilitarian compilation deserves a wide popularity among botanists.—D. D. KECK.

An Illustrated Manual of California Shrubs. By HOWARD E. McMINN. Pp. 1-689, 175 figs. J. W. Stacey, Inc. San Francisco. 1939. \$5.00.

The prominent place occupied by the shrub in the vegetation of California, throughout the broad expanses of chaparral, the brush associations of the forest floor, the gullies and the sea coast, makes it especially appropriate that this body of plants should receive such an excellent treatment at the hands of one who may well be called a specialist in this type of plant cover. Shrubs comprise about twenty per cent of the seed plants of this area and are so grouped into characteristic associations as to render them a well-defined unit of the flora. It is not to be expected that any author can delimit, to the satisfaction of all, the concept of what constitutes a shrub. Such delimitation must be, by its very nature, somewhat arbitrary. The present work includes all those forms "classified as woody perennials and semi-woody plants except trees and the succulent-stemmed plants of the Cactus Family. About eight hundred species and two hundred varieties of native shrubs, woody vines, subshrubs, woody cushion plants and halfshrubs have been recognized."

The introduction contains a brief statement on the naming of plants, the phylogenetic and ecological bases for classification, a discussion and classification of the shrub areas of California and a concise survey of the gross morphology of seed plants. In the classification of shrub types in the area concerned the following categories are admitted: desert shrub, Great Basin sagebrush, deciduous shrub, chaparral; all of which are termed "formations." The alpine and subalpine shrubs are treated under the heading, "the lesser shrub areas."

There are two separate keys, one to the genera, the other to the families. It is unusual to find the key to genera preceding the key to families; such an arrangement renders the latter key

somewhat superfluous. All the keys are carefully prepared, based on obvious rather than technical characters, and have been thoroughly tested. They are, therefore, eminently practical and easy to use. The descriptions are unusually full and complete and are provided with valuable supplementary information on biology, use and range. The work is profusely illustrated with pen drawings and photographs. Most of the drawings are from the skillful pen of Emily Patterson Thompson. The design on the cover is the fruit of *Crossosoma californicum*.

The family name at the top of each page would have been much more useful than the running head "Angiospermae." As it is, the running head does not assist one in gaining familiarity with the organization of the book. In the interest of consistency, the only subspecific category recognized is the variety. Such a policy calls for nomenclatorial changes that assume the terms "variety" and "subspecies" to be synonymous. It is conceivable that taxonomic concepts may be such as to render these terms synonymous in many cases, but the International Rules of Botanical Nomenclature definitely regard the variety as subordinate to the subspecies. The indiscriminate use of these two categories by many American botanists has made it very difficult for the writer of a general treatise, such as the one under consideration, to be consistent in the matter of usage. It would be very advantageous if the Rules would make specific mention favoring the use of simple trinomials for such a work as this, thus eliminating the necessity of designating the rank of each entity. In a very few cases, the names used are not in accordance with the International Rules, evidently due to oversight resulting from changes made in the rules during the time the work was being assembled.

The closing twenty-five pages comprise a valuable section dealing with the use of native plants as ornamentals. This portion of the volume was prepared by Fred H. Shumacher, of the United States Forest Service. To a community that has suddenly awakened to the landscape values to be derived from the native flora, this chapter should serve a very useful purpose. A classification has been prepared which is based upon landscape utility, and lists of plants are provided for each purpose.

One cannot congratulate the author on so fine a book without also complimenting the printer for such an excellent example of the book printer's art. The typography is remarkably fine and the illustrations very clear. This beautifully prepared book will make a highly desirable addition to the libraries of professional botanists, but it will be no less sought after by those whose chief interest in plants springs from a love of cultivating them. Professor McMinn has been eminently successful in bridging the gap between the technical needs of the practising botanist and the interests and questions of the amateur plant student and gardener.—HERBERT L. MASON.